

# Risk Factors for Suicide Attempts Among Navajo Adolescents

## ABSTRACT

**Background:** Rates of adolescent suicide in the United States are highest among Native Americans but little is known about risk factors for suicide attempts in this population.

**Methods:** To identify risk factors for self-reported suicide attempts by Navajo adolescents, we analyzed the 1988 Indian Health Service Adolescent Health Survey that was administered to 7,254 students in grades 6 through 12 on the Navajo reservation. The responses of students reporting a past suicide attempt were compared to others.

**Results:** Nearly 15 percent (N = 971) reported a previous suicide attempt; over half of those admitted to more than one attempt. Controlling for age, a logistic regression model revealed the following associations with suicide attempts: a history of mental health problems (OR = 3.2); alienation from family and community (OR = 3.2); having a friend who attempted suicide (OR = 2.8); weekly consumption of hard liquor (OR = 2.7); a family history of a suicide or attempt (OR = 2.3); poor self-perception of health (OR = 2.2); a history of physical abuse (OR = 1.9); female gender (OR = 1.7); and sexual abuse (OR = 1.5).

**Conclusions:** Efforts to prevent adolescent suicide attempts in this population should target individuals with those risk factors of the highest risk and prevalence of exposure. (*Am J Public Health*. 1991;81:870-874)

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## Introduction

In 1987, over 2,100 youths under age 19 in the United States killed themselves, making suicide the third most common cause of death in the US adolescent population. Although suicide rates in the US population have been relatively stable, rates among youths have tripled over the past 30 years, from 4.5 per 100,000 in 1950 in 13.1 per 100,000 in 1986.<sup>1</sup> Among US ethnic groups, American Indians and Alaskan Natives have the highest rates.<sup>2,3</sup> The suicide rate among Native American adolescents in 1987 was 26.8 per 100,000, more than double the national rate for adolescents of all races.<sup>4</sup>

For every completed suicide, it is estimated that eight or more are attempted.<sup>5</sup> The 1987 National Adolescent Student Health Survey reported that 11.1 percent of males and 17.5 percent of females from a national random sample of eighth and tenth grade students had harmed themselves in a way that might have caused their death.<sup>6</sup> The prevalence of suicide attempts among Native Americans may even be higher. Among a cohort of American Indian high school students attending a boarding school in the southeast US, 23 percent had attempted suicide during their lifetime.<sup>7</sup>

This high rate of self-destructive behavior among Native American adolescents warrants further investigation and culturally appropriate intervention. The 1988 Navajo Adolescent Health Survey offered an opportunity to examine a set of traditional risk factors that are thought to be important in the general population. This population was chosen because it had the largest and most complete participation in the Indian Health Service Adolescent Health Survey conducted in 1988.

The purpose of this study was to identify risk factors for self-reported suicide attempts among adolescent students in the Navajo Indian population.

## Methods

### Instrument

The source of data was the 1988 Navajo Adolescent Health Survey, a subset of the Indian Health Service Adolescent Health Survey. This 162-item survey was designed as a health promotion tool for use by the Indian Health Service and individual communities to identify and address problems in adolescent health. The original instrument was designed by Adolescent Health Program of the University of Minnesota<sup>8</sup> and adapted for use in Native American populations. After pilot testing, the survey was administered to Native American students throughout the United States. Content of the survey included personal data, information about the home and family, general health, nutrition, substance abuse, social concerns, experiences and attitudes regarding sex, mental health, and injury. The data from the Navajo Reservation represented more than 70 percent of the national sample.

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TABLE 1—Crude and Adjusted Odds Ratios of Risk Factors for Suicide Attempts

Category/Risk Factor	Odds Ratios		
	Crude	Adjusted*	95% CI
<b>Child Abuse</b>			
Physical abuse	4.0	1.9	1.5-2.4
Sexual abuse	3.4	1.5	1.2-1.9
<b>Demography</b>			
Female gender	1.8	1.7	1.4-2.0
Community of residence	1.4 (Community "D")	NS	
<b>Exposure to Suicide</b>			
Family history of attempt/completion	3.9	2.3	1.6-3.2
Friend history of attempt	5.0	2.8	2.3-3.4
Friend history of completion	3.7	NS	
<b>Family Structure</b>			
Biological mother absent	.8	NS	
Biological father absent	1.3	NS	
Parents separated	1.5	NS	
One parent dead	1.4	NS	
<b>Self-perception of Health Status</b>			
Poor Health	4.4	2.2	1.3-3.8
<b>Mental Health</b>			
History of mental, behavior problems requiring professional help	3.7	3.2	2.2-4.5
Extreme alienation from family & community	5.0	3.2	2.1-4.4
<b>Substance Abuse</b>			
Weekly use of beer/wine	1.4	NS	
Weekly use of hard liquor	4.2	2.7	1.9-3.9
Mother's daily use of beer/wine	2.6	**	
Mother's daily use of hard liquor	4.3	**	
Father's daily use of beer/wine	2.6	**	
Father's daily use of hard liquor	3.6	**	
<b>School Perception and Performance</b>			
"I hate School"	2.3	NS	
Less Than "C" Grade Point Average	2.0	**	
NS: Not significant after adjustment			
*Adjusted for age & all covariates			
**"N" Too small to enter regression (see text)			

### Study Site/Subjects

The Navajo Reservation is the largest Indian nation outside of Alaska with an estimated population of 190,000. Schools on or adjacent to the reservation were encouraged to participate, although each school or individual student could decline. A volunteer sample of 47 schools representing grades six to twelve participated in the survey. All students in participating schools were asked to voluntarily respond to the anonymous survey during class time. There was no attempt to survey students absent on that day. The response rate exceeded 70 percent of enrolled students in virtually all participating schools to yield a usable sample of 7,241 responses, representing approximately one-third of all eligible students on the Navajo reservation.

### Risk Factors

To determine risk factors for self-report of attempted suicide, we analyzed this survey using one question as the out-

come, or dependent, variable: "Have you ever tried to kill yourself?" The independent variables consisted of 28 survey items in eight categories (Table 1) hypothesized to be underlying risk factors for suicide attempts. There were one to six survey items in each category. All of the items, except alienation, were measured by a single survey question.

Alienation was assessed using a nine item scale (Table 2) that explores the respondent's connectedness with the family and community. This scale had substantial internal consistency (Cronbach's  $\alpha = 0.85$ ) and construct validity when compared to other items of a similar nature in the survey.

Students reporting a suicide attempt were compared to those with no such report for each of the hypothesized risk factors. Chi-square statistics were used to establish significance in these comparisons and the significance level was adjusted to .0018 by the Bonferroni correction for multiple comparisons. Items that met this

level of significance were entered in a multiple regression equation controlled for age and gender. Both forward stepwise and structured regression strategies were employed in this procedure. Using F tests, items that remained significant after adjustment for the other variables were entered into a logistic model. Estimates of adjusted odds ratios for each risk factor were derived from the coefficients of the logistic regression model. Categorical variables were divided into a series of dichotomous dummy variables; odds ratios presented for these variables represent comparison of the high versus low exposures. Data were analyzed with the SPSS-PC (SPSS Inc., Chicago, IL 60611) and EGRET (Statistics and Epidemiology Research Corp., Seattle, WA 98105) statistical packages.

### Results

The sample was 51 percent female with a median age of 14.4 years and ninth

TABLE 2—Alienation Scale Items

How much do you feel:

1. Adults care about you?
2. School people care about you?
3. Your parents care about you?
4. Church leaders care about you?
5. Tribal leaders care about you?
6. Your family cares about your feelings?
7. People in your family understand you?
8. You and your family have lots of fun together?
9. Your family pays lots of attention to you?

5 point Likert Scale (Not at all—Very much)

1 2 3 4 5

Reliability (Cronbach's alpha)  
coefficient = 0.85

Mean score: 32.3 (SD 8.0)

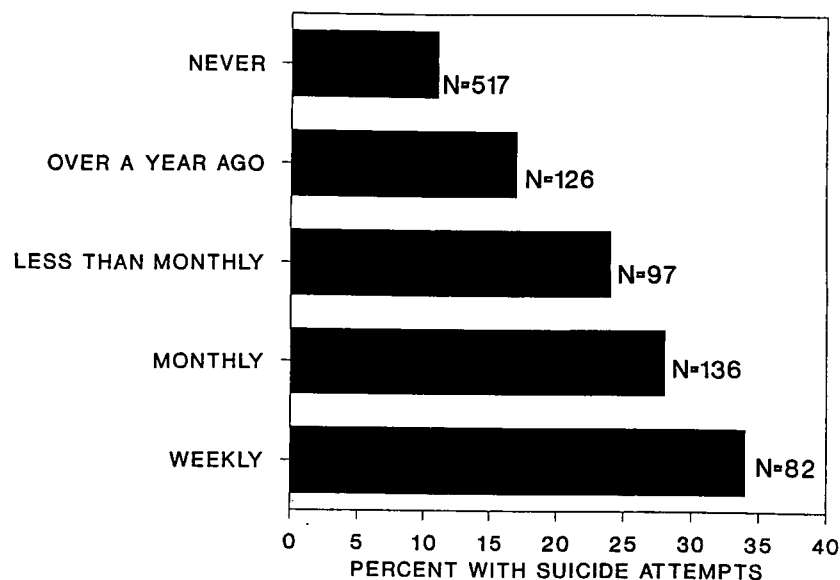


FIGURE 1—Suicide Attempts by Hard Liquor Use among Navajo Adolescents.

grade standing. Exposure to suicidal behavior among friends and family was common in this group of students. About 18 percent of the respondents replied that someone in their family had tried to kill or had killed themselves. Similarly, almost 18 percent had a friend who had attempted suicide and 9 percent had a friend who had completed suicide.

Of all respondents, 6,637 (92 percent) answered the question about suicide attempts; 971 (15 percent) admitted to a past attempt to kill themselves. Thirty-five percent of these attempts had occurred more than one year before the survey and 58 percent of the students had tried to kill themselves more than once. Thirty-six percent of suicide attempts were not reported to anyone and only 15 percent were brought to the attention of a medical professional.

In Table 1, the crude and adjusted odd ratios for hypothesized risk factors that were significant in distinguishing between respondents who had reported a previous suicide attempt, and those who had not, are shown.

In the final model, nine risk factors demonstrated a statistically significant and independent association with a history of suicide attempts. The two strongest associations were a history of a mental, behavioral, or emotional problem requiring professional help (OR = 3.2) and extreme alienation from family and community (OR = 3.2). Exposure to suicide completions and attempts by family and friends also shared strong associations with suicide attempts. Having a friend who pre-

viously attempted suicide (OR = 2.8) was more strongly associated with attempts by the respondent than having a family member either attempt or complete suicide (OR = 2.3). The consumption of hard liquor at weekly intervals was also significantly associated (OR = 2.7) with suicide attempts. The frequency of hard liquor consumption was linearly correlated with a lifetime prevalence of suicide attempts (Figure 1). Beer and wine consumption were not significant correlates at any frequency of use after adjustment for hard liquor use.

A self-perception of poor general health was also independently associated with a history of suicide attempts (OR = 2.2). The association of past physical abuse (OR = 1.9) with suicide attempts was marginally stronger than that of sexual abuse (OR = 1.5). Finally, the odds ratio for female gender remained significant after adjustment for covariates (OR = 1.7).

Several risk factors appeared to be associated with a past suicide attempt in the bivariate analysis but were not included in the model because of the many missing values. These variables included both the maternal and paternal consumption patterns of alcohol and the respondent's school performance as measured by the grade point average.

Risk factors which were significant in the bivariate analysis but did not remain significant after adjustment for other covariates, or after correction for multiple comparisons, included: community of residence, history of friend's suicide completion, all of the family structure variables,

the weekly use of beer or wine, household density, religiosity of the respondent, the household presence of the natural mother, and an adoptive father or stepfather.

## Discussion

To our knowledge, this is the first large controlled study of suicide attempts among Native American adolescents. The lifetime prevalence of self-reported attempts among Navajo students is high, but similar to that reported in the Minnesota and National Adolescent surveys.<sup>6,8</sup> The risk factors ascertained in this study of Native American youth are similar to those described for the general population.

An important finding of this study is the link between the suicide attempts of the respondents and those of their friends and family. Because prevalence of exposure was the highest for these risk factors and because of their strong association with suicide attempts, these risk factors have the greatest public health importance. Although bereavement following a family suicide is recognized to be a risk factor for suicidal behavior in older adults,<sup>9</sup> there have been few controlled studies documenting this risk in children and adolescents. The studies of adolescent suicide clusters, where a number of suicide deaths occur in a community over a short period, have been conflicting as to whether exposure to a friend's suicide is a risk factor.<sup>10-12</sup> But these studies have only evaluated deaths, not attempts, and

have studied only suicide deaths associated with a suicide cluster.

Alienation from family and community was independently associated with a history of previous suicide attempt. This supports findings from numerous uncontrolled studies in other populations, including Durkheim's sociologic analysis of suicide.<sup>13</sup>

The association of alcohol and suicide attempts confirms previous findings and demonstrates new ones. Chronic and acute ethanol intoxication appear to play an important role in completed suicides of both White and Native Americans.<sup>14,15</sup> In contrast, there are few data on the role of alcohol in suicide attempts, nor on the differences between varying types of alcohol. After adjustment for beer and wine consumption, use of hard liquor remained the significant alcohol-associated variable related to suicide attempts. The linear relationship between frequency of hard liquor use and the lifetime prevalence of suicide attempts suggests that its consumption (or a close proxy) may play a causal role in suicide attempts.

The finding that past sexual or physical abuse is a risk factor for suicide attempts correlates with reports from other populations. Riggs, *et al*, recently reported similar findings for sexual and physical abuse in a smaller survey of Rhode Island students, although these variables were not adjusted for other behavior and life events.<sup>16</sup> Our study also indicated an interaction between the gender and abuse variables, demonstrating that sexual abuse of males and physical abuse of females are associated with higher risks than the converse situations. This has not been described in other studies.

Mental health problems were expected to be risk factors as their association to suicidal behavior has been well described.<sup>17-19</sup> Despite this, few controlled studies have confirmed this finding in the American Indian population. Manson's survey of Indian adolescent students from a southeastern boarding school demonstrated that those with a past suicide attempt had a higher level of depressive symptomatology.<sup>7</sup> A recent controlled study of adolescents presenting to an urban emergency room for suicide attempts indicated that they were more likely than controls to have a history of mental health care.<sup>20</sup>

There are several limitations to this study. Its cross-sectional design did not allow us to establish the temporal relationship between these risk factors and the

suicide attempt. Mental health problems or alienation, may show associations because they may also be sequelae of an attempt. In addition, some associations may represent proxies for other variables not in the model. An example of a potential proxy might be child abuse, where the abuse history is important because it is symbolic of pervasive family dysfunction.

The survey did not measure the severity of the self-inflicted injury. Since only 15 percent of the attempts were reported to medical professionals, we infer that the unreported attempts represented gestures or minor injuries. Alternate interpretations are that potentially lethal attempts were only marginally successful, or that some of these unreported attempts were disguised as unintentional injuries, e.g. single occupant motor vehicle crash.

Because the study was conducted in school, it did not include those students absent on the day of the survey. Students who had been expelled, suspended, or had dropped out before the survey also were not represented. All of these groups may be at higher risk for many of these behaviors and life events. This may have led to an underestimate of the true lifetime prevalence of suicide attempts.

Although the use of anonymous self-reported questionnaires precluded corroboration of responses with existing data sources such as medical and social service records, its anonymity may have been an important safeguard of its validity. Since many of these behaviors are illicit or taboo, adolescents may be reluctant to disclose such information in a survey with identifiers. The validity of the self-reported information is supported by the similarity of these results to those from other studies.

Finally, this survey did not include some potentially important risk factors in this population. Exposure to traumatic deaths other than suicides and adaptability to a bi-cultural environment were not included but may also be important risk factors.<sup>21,22</sup>

The causal model of suicidal behavior is extremely complex and appears to vary between age and cultural groups. The causal model will be constructed using risk factors derived from controlled studies. Future preventive strategies should focus on identified risk factors that can be modified.<sup>23</sup> Furthermore, public health efforts to reduce suicide rates will be most successful if focused on those risk factors with the highest attributable risk. Future research efforts to determine the etiology of suicidal behavior in the American In-

dian and Alaskan Native populations should be directed toward carefully designed population-based case-control studies. □

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## Job Stress Is "Epidemic," Costly to Business, Study Finds

One in three Americans seriously thought about quitting work in 1990 because of job stress, and one in three expects to "burn out" on the job in the near future.

A recent study also claims that workplace stress is causing far greater turnover, lower productivity, higher absenteeism, and more frequent health problems than was previously recognized. Employees who are overworked or have little control over their job are most likely to be burnout victims.

These are among findings from a study prepared by Northwestern National Life (NWNL) Insurance Company identifying the extent, causes, costs, and solutions related to workplace stress. Unlike many earlier studies, the NWNL research is believed to be the first to correlate causes and cures in all occupations and populations across the United States.

Any major change in the workplace affecting staffing is likely to speed up employee burnout, the research suggests. Significant burnout occurred in companies that had substantially cut employee benefits, changed ownership, required frequent overtime, or reduced the work force.

The findings are from interviews with a representative sample of 600 American workers. To help address the problem, NWNL also assembled a panel of stress and wellness experts to construct a workplace stress test that enables a company to quickly measure its work force stress and identify the consequences and solutions.

Among NWNL's key findings are the following:

- Seven in 10 American workers say that job stress is causing frequent health problems, and is making them less productive.
- Thirty-four percent of Americans thought seriously of

quitting their job in 1990 because of workplace stress. Fourteen percent of all employees said workplace stress actually caused them to quit or change jobs in the last 2 years.

- Forty-six percent say their job is highly stressful. This is double the findings of a 1985 National Health Interview Survey that said 20% of Americans experience a high level of stress.

- Seventeen percent report higher absenteeism due to job stress.

- Fifty-three percent of Americans are required to work more than 40 hours a week very or somewhat often.

- Eighty-two percent of workers say victims of burnout deserve disability pay from their employer.

- Peggy Lawless, NWNL's research analyst, noted that job stress and burnout have a foothold in the US work force without regard to region, size of company, type of job, or age of the worker.

Lawless said the survey also shows that companies with supportive work and family policies, health coverage for mental illness and chemical dependency treatment, improved communication, and flexible work hours have almost half the burnout rate of companies that don't have such policies.

Lawless likened workplace stress in the 1990s to the lack of workplace safety in the 1960s. "Stress is less visible than coal dust or dangerous machines, but it's more prevalent and just as damaging to health and productivity."

The research results and the NWNL Workplace Stress Test are contained in a copyrighted report by NWNL called "Employee Burnout: America's Newest Epidemic." Copies can be obtained by calling 612/342-7137.

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